

**REMARKS**

Appreciation is hereby expressed to Examiner Robinson for the telephone interview so courteously conducted on April 15, 2005. Pursuant to that interview, applicants have prepared and are attaching hereto the Declaration of Norio Kaneko which describes a number of experiments performed by him and/or under his direction. Claims 1-3 remain in the application.

Reconsideration is respectfully requested of the rejection of Claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over Siersch 9408066.

The stereomicroscope of the present invention which is used for dental treatments has the following features:

- (a) The stereomicroscope has a single illumination optical system, and
- (b) The illumination unit has an optical axis arranged inside a circle which has a diameter connecting the optical axis of the right and left observation optical system in a plane including at least the lenses of the right and left optical systems positioned closest to an observation target.

A stereomicroscope having these features provides appropriate shadows in canal shaped targets, such as a root canal of a tooth. If a microscope lacks the feature (a), namely has plural illumination units, it is difficult to produce an appropriate shadow. Plural illumination deletes shadows on such canal shaped targets. Also, if the stereomicroscope lacks the above condition of feature (b), the light from the illumination unit does not reach inside of the canal shaped target such as a root canal in a tooth.

The Examiner's sole reference relied upon in the rejection is Siersch 9408066 which has been previously discussed in the prosecution history of this application. However, there appears

to be a number of factual and legal issues presented by this rejection and from the previous prosecution history in this case.

In view of the Examiner's comments in the rejection, it is believed that the first issue presented is the following factual issue:

(1) Whether the Siersch reference relied upon by the Examiner discloses an inclined illuminator binocular stereomicroscope having:

(a) a single illumination optical system having an illumination unit for illuminating an object targeted for observation relatively perpendicular to a plane of the observation target without use of lenses or prisms to magnify or redirect the illumination; and

(b) an illumination unit having an optical axis arranged inside a circle, the circle having a diameter connecting the optical axis of the right and left observation optical systems in a plane including at least the lenses of the right and left observation optical systems positioned closest to the observation target.

It is respectfully submitted that the answer to this issue is in the negative since the Siersch reference does not disclose the combination of the above features (a) and (b).

To assist the Examiner in analyzing the Siersch reference, Figs. 1 and 3 of the Siersch reference are attached hereto as Exhibit A. Both of these Figs. 1 and 3 have been modified by having a circle superimposed on Figs. 1 and 3 connecting the optical axis of the right and left observation optical systems.

It can be seen from Exhibit A, Fig. 1 of the Siersch reference, that there is disclosed a single illumination system (17) plus (14). However, the center of the illumination system (14) is

outside of the circle having a diameter connecting the optical axis of the right and left observation optical systems. Therefore, the stereomicroscope shown in Fig. 1 of the Siersch reference fails to disclose the combination of features (a) and (b) identified above. On the contrary, Fig. 1 of Siersch would in fact teach away from the present invention which emphasizes the importance of having the optical axis of the illumination unit inside a circle connecting the optical axis of the right and left observation optical systems.

Turning now to Exhibit A, Fig. 3 of the Siersch reference, it can be seen that Fig. 3 illustrates the use of two illumination systems, (21) and (21) plus (14). Moreover, careful inspection of Fig. 3, with a circle having a diameter connecting the optical axis of the right and left observation optical systems, clearly illustrates that one of the illumination systems (14) has an optical axis arranged outside of the circle and the other optical system (21) has its optical axis arranged on the circle whose diameter connects the optical axis of the right and left observation optical system.

It is therefore clear that the Siersch reference fails to disclose the features called for in Claim 1 herein, i.e., the use of a single illumination optical system wherein the illumination unit has an optical axis arranged inside a circle having a diameter connecting the optical axis of the right and left observation optical systems. On the contrary, that teaching or suggestion comes only from the present application, and constitutes an important element or aspect of the present invention.

Moreover, since the Siersch reference discloses that two illumination systems can be used and that the illumination unit can have an optical axis arranged on or outside of the circle having

a diameter connecting the optical axis of the right and left observation optical systems, it is respectfully submitted that the Siersch reference in fact teaches away from the invention called for in the claims herein.

A second issue raised by this rejection is a legal issue. The Examiner has predicated the rejection based on Siersch on the conclusion that omission of an element and its corresponding function requires only ordinary skill in the art. It is respectfully submitted that this is an oversimplification of the general rule discussed in Walker, Patents, 26-36 (2d ed. 1889), wherein Walker analyzed the cases and recited that it is not invention:

“to omit one or more of the parts of an existing thing, unless that omission causes a new mode of operation of the parts retained;” (emphasis added)

The Examiner’s attention is also directed to the case of American Original Corp. v. Jenkins Food Corp., 216 USPQ 945 (4<sup>th</sup> Cir., 1982), wherein the court held that removal of a certain step vastly improved a process.

It is respectfully submitted that the omission of one of the optical illumination systems of the prior art causes a new mode of operation of the parts retained, i.e., there is an improvement in the operation of a stereomicroscope by omitting one of the illumination units of the Siersch reference. In this connection, applicants are submitting herewith as Exhibit B the Declaration of Norio Kaneko dated March 18, 2005 which sets forth a number of tests conducted by and/or under his direction.

In the Declaration of N. Kaneko, there is described in experiment no. 1, the use of a stereomicroscope having a single illumination system positioned close to the observation system

wherein the illumination unit has an optical axis arranged inside a circle having a diameter connecting the optical axis of the right and left observation optical systems. Using this stereomicroscope in experiment No. 1, photographs were taken of a molar having a single root canal and another molar having a double root canal as illustrated in the Declaration.

In experiment no. 2 a stereomicroscope was used having a single illumination system where the illumination unit has an optical axis arranged outside of a circle having a diameter connecting the optical axis of the right and left observation optical systems. Again, the stereomicroscope in experiment no. 2 was used to photograph a molar having a single root canal and a molar having a double root canal. It can be seen from the photographs that light from the illumination system cannot reach the inner part of the root canal, and it is difficult to observe that part. At the same time, the shade made by the illumination system becomes wide and unclear.

In experiment no. 3, there is disclosed the use of a stereomicroscope having a double illumination system between the observation systems. In experiment no. 3, only one of the illumination optical systems has the optical axis arranged inside a circle having a diameter connecting the optical axis of the right and left observation optical systems. This system was used to photograph molars having a single root canal and a molar having a double root canal. It was found and as can be seen from the photographs that because the subject is illuminated from two directions opposite each other, shade made by the illumination system is pale and unclear. Moreover, at the same time, the inner part of the root canal which is difficult to be illuminated from both directions tends to be dark compared with an outer part of the tooth which is illuminated by both sides. Moreover, because the contrast between the illuminated part and the

non-illuminated part becomes large, the non-illuminated part is difficult to be observed.

The results of these tests clearly demonstrate that omission from a illuminator binocular stereomicroscope of one of a dual illumination optical systems causes a new mode of operation of the one illumination system retained, i.e., improved illumination of molars which have root canals cut in them. In these cases, the illumination reaches an inner part of the recesses of the root canals since the single illumination system can make short and clear shade around the subject so as to make a three-dimensional observation.

In contrast, when two illumination optical systems in experiment no. 3 were used to examine molars with single and double root canals, it was found (as evidenced by the photographs), that the inner part of the root canal is difficult to be illuminated from both directions. The root canals tend to be dark when compared with the outer part of the tooth which is illuminated by both sides.

It is therefore apparent that omission of one of the two illumination optical systems from the stereomicroscope of the prior art causes a new mode of operation of the parts retained. Therefore, in view of the foregoing and the evidence presented in the Declaration of Norio Kaneko, it is respectfully submitted that the rejection fails as a matter of law in view of the above authorities.

Moreover, it is also clear from Exhibit A attached hereto and Figs. 1 and 3 of the Siersch reference that this reference nowhere discloses an incline illuminator binocular stereomicroscope having the combination of a single illumination optical system having an optical axis arranged inside a circle having a diameter connecting the optical axis of the right and left observation

optical systems. On the contrary, that teaching or suggestion comes only from the present application and constitutes an important element or aspect of the present invention.

In view of the foregoing, it is respectfully submitted that the rejection fails based on the analysis of the reference and also as a matter of law as discussed above. For these reasons, it is respectfully submitted that the Examiner would be justified in no longer maintaining this rejection. Withdrawal of the rejection is accordingly respectfully requested.

Reconsideration is respectfully requested of the rejection under 35 U.S.C. 103(a) as being unpatentable over Buhler, 3,909,106.

Although the Examiner does not state which claims are being rejected, it is assumed that the rejection means Claims 1-3.

The Buhler reference discloses in Fig. 1 a stereomicroscope having two different types of illuminating systems, namely, a fiber optics illuminating system 16 and coherent fiber optics illuminating system 17 which is referred to in column 2, lines 37-39, and column 4, lines 4-6 as a remote imaging system. This system is believed to include a source of illumination. Light from the illumination systems passes through several lenses including objective lens 14 (see Fig. 2). It can be seen from Figs. 2 and 3 of Buhler that light from illumination means 16 and 17 passes through objective lens 14 having a focal point 15.

It is therefore clear that the Buhler reference fails to disclose a single illumination optical system having an illumination unit for illuminating an object targeted for observation relatively perpendicular to a plane of the observation target without use of lenses or prisms to magnify or redirect the illumination. On the contrary, that teaching or suggestion comes only from the

present application, and constitutes an important element or aspect of the present invention.

Moreover, attached hereto is Exhibit C showing Figs. 1 and 2 of the Buhler reference with a circle drawn on Fig. 1 wherein the circle has a diameter connecting the optical axis with a right and left observation optical system. It can be seen from Exhibit C that the stereomicroscope of Buhler has two illumination systems 16 and 17 with a center of one of the illumination systems 16 being on a circle which has a diameter connecting the optical axis of the right and left observation optical systems. It is therefore apparent that the Buhler reference fails to show a single illumination optical system with an optical axis arranged inside a circle which has a diameter connecting the optical axis of the right and left observation system, and wherein the single illumination system illuminates an object targeted for observation relatively perpendicular to a plane of the observation target without use of lenses or prisms to magnify or redirect the illumination.

The test data set forth in the Declaration of Norio Kaneko emphasizes the importance of the features called for in the claims herein for making small and clear shade around a subject to be observed. The test data demonstrates the importance for the stereomicroscope to have these features because the shade is observed from the right and left side to recognize the subject as a three-dimensional object. This is especially important in observing root canals in three-dimension since tooth portions have concave portions inside.

In determining whether the subject matter as a whole is obvious, all evidence bearing on the subject must be considered. In re Soni, 54 Fed 3d 746, 34 USPQ 2d 1684 (CAFC, 1985). Proof of an unexpected improvement can rebut a prima facie case of obviousness. In re Murch,



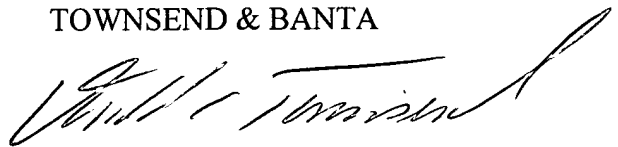
464 Fed 2d 1051, 175 USPQ 89 (CCPA, 1972).

In the present case, it is respectfully submitted that the photographic evidence presented with Exhibit 2, i.e., the Declaration of N. Kaneko, clearly demonstrates the unexpected improvement in imaging of single and double root canals on teeth using the inclined illuminator binocular stereomicroscope of the present invention. Consequently, it is believed that the rejection fails, as a matter of law, in view of the above authorities. For this reason, the Examiner would be justified in no longer maintaining the rejection. Withdrawal of the rejection is accordingly respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is now in condition for allowance, and early action and allowance thereof is accordingly respectfully requested. In the event there is any reason why the application cannot be allowed at the present time, it is respectfully requested that the Examiner contact the undersigned at the number listed below to resolve any problems.

Respectfully submitted,

TOWNSEND & BANTA

A handwritten signature in cursive script, appearing to read "Donald E. Townsend".

Donald E. Townsend  
Reg. No. 22,069

A handwritten signature in cursive script, appearing to read "Donald E. Townsend, Jr.".

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